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10/630,913	07/31/2003	Venugopal K. Srinivasamurthy	1509-437	7570

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EXAMINER
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DAO, THUY CHAN

ART UNIT	PAPER NUMBER
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2192

MAIL DATE	DELIVERY MODE
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06/05/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/630,913

Applicant(s)

SRINIVASAMURTHY ET AL.

Examiner

Thuy Dao

Art Unit

2192

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 and 20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 and 20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07/31/03 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. This action is responsive to the amendment filed on March 13, 2007.
2. Claims 1-17 and 20 have been examined.

### **Response to Amendments**

3. Per Applicants' request, claims 1-17 and 20 have been amended and claims 18-19 have been canceled.
4. The objection to drawings Figure 2 is withdrawn in view of Applicants' amendments.
5. The objection to the specification and claims is withdrawn in view of Applicants' amendments.
6. The 35 USC §112, second paragraph rejection over claims 7-8, 11, 14-16, and 18 is withdrawn in view of Applicants' amendments.
7. The 35 USC §101 rejection over claims 18-20 is withdrawn in view of Applicants' amendments.

### **Response to Arguments**

8. The Applicants are thanked for a thorough reply. Applicants' arguments have been considered but are moot in view of the new ground(s) of rejection.

### **Drawings**

9. The drawings are objected to because:

Figure 2 should either be bigger (as the original) or have a same text font size (so that the legend "*Java Application Trace or Probabilistic Estimate*" could be clearly readable); and

Figures 4b and 5, horizontal windows should have correct borders and should not cross out any instructions or methods.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure

number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### **Specification**

10. Applicant is reminded of the proper language and format for an abstract of the disclosure. The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc. (e.g., "*The invention provides ... The invention also provides ... The invention may ...*" in lines 1, 6, and 9).

### **Claim Objections**

11. Claims 8 and 11 are objected to because of minor informalities.

Claim 8, line 2, the phrase is considered to read as - "...is dynamically embedded to enable it to ...- -; and

Claim 11, line 1, the phrase is considered to read as - -[[The]] A method of generating ... - -.

Appropriate correction is required.

### **Claim Rejections – 35 USC § 102**

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. Claims 1-17 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent No. 7,080,373 B2 to Plaxton et al. (art made of record, hereinafter "Plaxton").

#### **Claim 1:**

Plaxton discloses *a method of optimizing the performance of an interpreter-based runtime system,*

*said runtime system including a virtual machine, the virtual machine adapted to run an application in the context of the runtime environment (e.g., FIG. 5, col.8: 1 – col.9: 7; col.9: 8-37),*

*the method comprising augmenting the bytecode set of the virtual machine with application-specific opcodes by reference to said application (e.g., col.6: 30-38; FIG. 6, blocks 135-140, blocks 135-146, col.9: 8-37),*

*thereby constituting an application domain-specific virtual machine (e.g., FIG. 6, blocks 140, 150, 156, and 157, col.9: 8-37; col.8: 1 – col.9: 7).*

#### **Claim 2:**

The rejection of claim 1 is incorporated. Plaxton also discloses *the virtual machine is a Java Virtual Machine* (e.g., FIG. 3, col.5: 37-64).

**Claim 3:**

The rejection of claim 1 is incorporated. Plaxton also discloses *a new application domain-specific virtual machine is generated for different categories of applications* (e.g., col.9: 8-37; col.8: 1 – col.9:7).

**Claim 4:**

The rejection of claim 1 is incorporated. Plaxton also discloses *the dynamic and/or static behavior of the application is used to create new opcode for the application domain-specific virtual machine* (e.g., col.6: 30-38).

**Claim 5:**

The rejection of claim 1 is incorporated. Plaxton also discloses *the virtual machine is optimized based on the hierarchy of the architecture for which the runtime environment is adapted and/or the semantics of the application which is to be run on it* (e.g., col.6: 1-29).

**Claim 6:**

The rejection of claim 1 is incorporated. Plaxton also discloses *the virtual machine is optimized based on a late-binding or dynamic loading model and runtime constant manifestation* (e.g., col.6: 39 – col.7: 12).

**Claim 7:**

The rejection of claim 1 is incorporated. Plaxton also discloses *semantically enriched code is statically embedded to enable it to run fast on the application domain-specific virtual machine which is newly generated* (e.g., FIG. 6, blocks 140, 156, and 157, col.9: 8-37; col.8: 1 – col.9: 7).

**Claim 8:**

The rejection of claim 1 is incorporated. Plaxton also *semantically enriched code is dynamically embedded to enable it to run fast on the application domain-specific virtual machine, said virtual machine newly generated* (e.g., FIG. 6, block 150, col.9: 8-37).

**Claim 9:**

The rejection of claim 1 is incorporated. Plaxton also discloses *the semantically enriched code is determined by performing a quantitative trade-off between time and space* (e.g., col.2: 21-58).

**Claim 10:**

The rejection of claim 1 is incorporated. Plaxton also discloses *the semantically enriched code is determined based on the dynamic and/or static behavior of the application* (e.g., col.2: 59 – col.3: 14).

**Claim 11:**

Plaxton discloses *a method of generating an embedded virtual machine for a specific domain of an application, comprising the step of embedding semantically enriched code in an interpreter loop of the virtual machine* (e.g., FIG. 6, blocks 140, 156, and 157, col.9: 8-37).

**Claim 12:**

The rejection of claim 11 is incorporated. Plaxton also discloses *the semantically enriched code embedding step is performed dynamically on newly loaded portions of the application in dynamic languages* (e.g., FIG. 6, block 150, col.9; 8-37).

**Claim 13:**

The rejection of claim 12 is incorporated. Plaxton also discloses *the interpreter is dynamically enhanced* (e.g., col.6: 30-38).

**Claim 14:**

The rejection of claim 11 is incorporated. Plaxton also discloses *secondary codes are used to accommodate the interpretation of new semantically enriched codes* (e.g., col.6: 30-38).

**Claim 15:**

The rejection of claim 14 is incorporated. Plaxton also discloses *the encoding of the new semantically enriched codes of the instruction set of the virtual machine is performed for efficient decoding of the frequently executed codes* (e.g., col.9: 2-8).

**Claim 16:**

The rejection of claim 14 is incorporated. Plaxton also discloses *if a particular code is used frequently, it is made into a single byte code and the rest of the semantically enriched codes are accommodated by secondary codes* (e.g., col.9: 38-49).

**Claim 17:**

Plaxton discloses *a method of optimizing the performance of an application running on an interpreter-based runtime system* (e.g., FIG. 5, col.8: 1 – col.9: 7; col.9: 8-37), *the method comprising augmenting the bytecode set of the interpreter with application-specific opcodes by reference to said application* (e.g., col.6: 30-38; col.9: 8-37), *thereby constituting an application domain-specific virtual machine* (e.g., col.9: 8-37; col.8: 1 – col.9: 7).

**Claim 18:**

Plaxton also discloses *a computer program, recorded on a computer-readable medium, to perform the method as claimed in claim 17* (e.g., FIG. 3, col.5: 37 – col.6: 67; FIG. 4, col.7: 12-67).



14. Claims 1, 11, and 17-18 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent No. 6,988,261 B2 to Sokolov et al. (art made of record, hereinafter "Sokolov").

**Claim 1:**

Sokolov discloses *a method of optimizing the performance of an Interpreter-based runtime system,*

*said runtime system including a virtual machine, the virtual machine adapted to run an application in the context of the runtime environment (e.g., FIG. 2B, col.6: 10-39),*

*the method comprising augmenting the bytecode set of the virtual machine with application-specific opcodes by reference to said application (e.g., Appendix A, col.11-14; col.3: 14-27; col.5: 37-48),*

*thereby constituting an application domain-specific virtual machine (e.g., col.5: 66 – col.6: 9; col.7: 37-59).*

**Claim 11:**

Sokolov discloses *a method of generating an embedded virtual machine for a specific domain of an application (e.g., col.6: 10-39; col.11-14; col.3: 14-27), comprising the step of embedding semantically enriched code in an interpreter loop of the virtual machine (e.g., col.5: 37 – col.6: 9; col.7: 37-59).*

**Claim 17:**

Sokolov discloses *a method of optimizing the performance of an application running on an interpreter-based runtime system (e.g., col.6: 10-39), the method comprising augmenting the bytecode set of the interpreter with application-specific opcodes by reference to said application (e.g., col.11-14; col.3: 14-27), thereby constituting an application domain-specific virtual machine (e.g., col.5: 66 – col.6: 9; col.7: 37-59).*

**Claim 18:**

Sokolov also discloses *a computer program, recorded on a computer-readable medium, to perform the method as claimed in claim 17* (e.g., col.3: 15 – col.4: 19; col.5: 55 – col.6: 38).

### Conclusion

15. Any inquiry concerning this communication should be directed to examiner Thuy Dao (Twee), whose telephone is (571) 272 8570. The examiner can normally be reached on the first Monday of the bi-week, and every Tuesday, Thursday, and Friday from 6:00AM to 6:00PM.

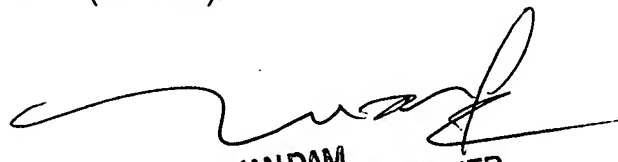
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam, can be reached at (571) 272 3695.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273 8300.

Any inquiry of a general nature of relating to the status of this application or proceeding should be directed to the TC 2100 Group receptionist whose telephone number is (571) 272 2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

T. Dao



TUAN DAM  
SUPERVISORY PATENT EXAMINER